IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant:	Mark Lauer	Ser. No:	09/912,723
Filing Date:	July 23, 2001	Examiner:	W. Klimowicz
Docket No:	LAUM-004	GAU:	2652

For: ELECTROMAGNETIC HEADS, FLEXURES, GIMBALS AND ACTUATORS FORMED ON AND FROM A WAFER SUBSTRATE

December 8, 2005

MS Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF FOR APPELLANT

This is an Appeal of the Final Rejection of claims 1-4, 6-14 and 17-29 dated July 6, 2005. A Notice of Appeal was filed by appellant on October 6, 2005 and received by the Patent Office October 11, 2005.

Real Party In Interest

Mark Lauer is the real party in interest.

Related Appeals and Interferences

Appellant knows of no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this pending Appeal. A prior Appeal Brief was filed in this case, but the case was removed from appeal and prosecution was reopened with a new rejection dated January 11, 2005. Appellant is not aware whether any appeal number was previously assigned.

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Status of Claims

The application was originally filed with 20 claims. In response to a Restriction Requirement mailed March 31, 2003, Appellant on April 30, 2003 cancelled claims 5, 15 and 16 without prejudice, and amended claims 1 and 20. In an Amendment dated May 11, 2005, appellant added claims 21-29. Pending claims 1-4, 6-14 and 17-29 are the subject of this Appeal. Appendix A lists the claims that are the subject of this Appeal.

Status of Amendments

On September 6, 2005, appellant filed an Amendment After Final Rejection, which was not entered by the Examiner. On September 30, 2005, appellant filed a Second Amendment After Final Rejection, which also was not entered by the Examiner.

Summary of Claimed Subject Matter[1]

Claim 1 recites a device for reading or writing information, the device comprising: an electromagnetic transducer (FIGs. 1, 3, and 20: 40, 44; p. 7, ll. 7 - 6) including a plurality of solid transducer layers (FIGs. 1, 3, and 20: 40, 44, 102, 105, 110, 112, 118, 120, 122, 125 and 127), a substrate (FIGs. 3 and 4: 100; p. 10, ll. 26 - 32; p. 11, ll. 12 - 28; p. 23, ll. 17 - 20) adjoining said transducer, said substrate shaped as a rigid body (FIGs. 1, 2, 20 and 23: 33; p. 8, l. 5 - p. 9, l. 6; p. 25, ll. 8 - 13) adjacent to said transducer and as a plurality of flexible elements (FIGs. 1, 2, 20 and 23: 35, 38; p. 8, l. 5 - p. 9, l. 6; p. 25, ll. 8 -13) distal to said transducer, and an actuator (FIGs. 20 - 23: 404, 408; p. 4, l. 27 - p. 5, l. 2; p. 22, l. 1 - p. 23, l. 16; p. 25, ll. 8 -28) attached to said substrate distal to said transducer (FIGs. 20 - 23; p. 4, l. 17 - p. 5, l. 2; p. 7, ll. 11 – 14, 22 - 25; p. 22, l. 1 - p. 23, l. 16; p. 25, ll. 17 -25; p. 28, ll. 25 – 32; Abstract: ll. 1 - 7).

Independent claim 11 recites a device for reading or writing information, the device comprising: a wafer substrate piece (FIGs. 3, 4 and 5: 100; p. 10, ll. 26 - 32; p. 11, ll. 12 - 28; p. 23, ll. 17 - 20) disposed between an electromagnetic transducer (FIGs. 1, 3,

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[1] The following summary pursuant to 37 CFR §41.37(c)(1)(v) is a concise explanation of the independent claims and is to be read in light of the disclosure. For conciseness this summary does not list all of the places in the specification and figures that relate to those claims. This summary does not limit the claims (see MPEP §1206).

and 20: 40, 44; p. 7, ll. 7- 16) and an electrostrictive actuator (FIGs. 20 - 23: 404, 408; p. 4, l. 27 - p. 5, l. 2; p. 22, l. 1 - p. 23, l. 16; p. 25, ll. 8 -28; Abstract: ll. 1 - 4), said substrate piece shaped as a rigid body (FIGs. 1, 2, 20 and 23: 33; p. 8, l. 5 - p. 9, l. 6; p. 25, ll. 8 - 13) adjoining said transducer and as a flexible element connecting said rigid body and said actuator (FIGs. 1, 2, 20, 21 and 23: 35, 38; p. 8, l. 5 - p. 9, l. 6; p. 25, ll. 8 - 13; Abstract: ll. 4 - 7).

Independent claim 20 recites a device for reading or writing information, the device comprising: an electromagnetic transducer (FIGs. 1, 3, and 20: 40, 44; p. 7, ll. 7 - 6) including a plurality of solid transducer layers (FIGs. 1, 3, and 20: 40, 44, 102, 105, 110, 112, 118, 120, 122, 125 and 127), a substrate (FIGs. 3 and 4: 100; p. 10, ll. 26 - 32; p. 11, ll. 12 - 28; p. 23, ll. 17 - 20) adjoining said transducer, said substrate shaped as a rigid body (FIGs. 1, 2, 20 and 23: 33; p. 8, l. 5 - p. 9, l. 6; p. 25, ll. 8 - 13) adjacent to said transducer and as a plurality of flexible elements (FIGs. 1, 2, 20 and 23: 35, 38; p. 8, l. 5 - p. 9, l. 6; p. 25, ll. 8 -13) distal to said transducer, and actuation means (FIG. 20: 404, 408,; FIG. 21: 404, 408, 455; FIGs. 22-23: 404, 408, 452, 455; FIG. 24: 502, 505, 522, 525, 530, 533; FIG. 25: 505, 525, 533; FIGs. 26 and 27: all except 600; FIG. 28: all except 710; p. 4, l. 27 - p. 5, l. 2; p. 22, l. 1 - p. 23, l. 16; p. 25, ll. 8 - 28; p. 26, ll. 1 - 32; p. 27, l. 19 – p. 31. l. 20; Abstract: ll. 4, 7 and 19) for positioning said transducer, said actuation means attached to said substrate distal to said transducer (FIGs. 20 - 23; p. 4, l. 17 - p. 5, l. 2; p. 7, ll. 11 - 14, 22 - 25; p. 22, l. 1 - p. 23, l. 16; p. 25, ll. 17 -25; p. 28, ll. 25 – 32; Abstract, ll. 1 - 7).

Grounds of Rejection to be Reviewed on Appeal

(1) The rejection of claims 23, 26 and 29 under 35 U.S.C. §112, ¶ 2, as allegedly being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention.

(2) The rejection of claims 23, 26 and 29 under 35 U.S.C. §112, ¶ 1, as allegedly failing to comply with the written description requirement.

(3) The rejection of claims 1, 7-10, 20-25, 27 and 28 under 35 U.S.C. §102(b) as allegedly being anticipated by Japanese Published Application No. 09-035230 to Harada et al. ("Harada").

(4) The rejection of claims 21-23 and 27-29 under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,757,573 to Tokuyama et al. ("Tokuyama").

(5) The rejection of claims 2-4, 11-14, 17,19, 24 and 25 under 35 U.S.C. §103(a) as allegedly being unpatentable over Harada in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No 36, Iss. No. 2, pp. 379-380, published February 1, 1993 ("IBM TDB").

(6) The rejection of claim 6 under 35 U.S.C. §103(a) as allegedly being unpatentable over Harada in view of Japan Patent JP 06-176517 A to Endo ("Endo").

(7) The rejection of claim 18 under 35 U.S.C. §103(a) as allegedly being unpatentable over Harada in view of Endo and in further view of Japan Patent JP 09-148639 A to Fukuoka ("Fukuoka").

(8) The rejection of claims 21 and 27 under 35 U.S.C. §103(a) as allegedly being unpatentable over Harada.

(9) The rejection of claims 24-26 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tokuyama in view of IBM TDB.

Argument

I. Regarding Grounds of Rejection (1), the Final Rejection states, on page 4:

> Claims 23, 26 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention.
>
> As per newly presented claims 23, 26 and 29, the phrase "wherein ***no part*** of said substrate is disposed further than said transducer from said actuator" (emphasis added) is misdescriptive to the disclosed invention, and thus ambiguous. More concretely as is clearly shown in FIG. 1, the head (33) includes portions that are located laterally and beyond/above (in terms of the positive "x" direction) the transducing elements within pad (50); as noted in Figure 1 of Applicant's disclosure, the upper plane of head substrate (33) clearly and unambiguously lies "above" the transducer layers (40) and (44), albeit slightly so.

1. Claims 23, 26 and 29

Appellant respectfully but strongly disagrees with the Examiner's allegation that "the phrase 'wherein no part of said substrate is disposed further than said transducer

from said actuator' is misdescriptive to the disclosed invention, and thus ambiguous." This allegation is based on the Examiner's further allegation that the "substrate" is the "head (33)" or "pad (50)," which is misleading in that it either ignores or purposefully disregards the "substrate 100" that is shown for example in FIG. 3 as part of "the head 33." Moreover, appellant respectfully asserts the Examiner's particular interpretation of the specification is largely irrelevant to the determination of whether the claims are definite in compliance with 35 U.S.C. §112, ¶2. See, e.g., *In re Borkowski*, 422 F.2d 904, 909 (C.C.P.A. 1970); *Stiftung v. Renishaw PLC*, 945 F.2d 1173, 1181 (Fed. Cir. 1991); *Miles Laboratories, Inc. v. Shandon Inc.*, 997 F.2d 870, 874-875 (Fed. Cir. 1993), *cert. denied*, 510 U.S. 1100 (1994).

Further, appellant respectfully asserts that the Examiner's particular interpretation of the "head 33" as "the substrate," while reasonable in some situations, is unreasonable in this rejection because it selectively ignores many teachings of the original specification to allege that the claims are "misdescriptive to the disclosed invention." To promote his allegation of indefiniteness, the Examiner mislabels the "head 33" as "head substrate (33)," but the term "head substrate (33)" is absent from the application. Similarly, the Examiner purposefully avoids referring to the "substrate 100" or "wafer substrate," which are described repeatedly in the application as that which transducers are formed atop (with actuators formed on the opposite surface of the "wafer substrate"). Indeed, while the specification repeatedly describes a "substrate" (e.g., Title; Abstract; p. 4, l. 35; p. 7, l. 31; p. 8, ll. 2, 12; p. 10, l. 27; p. 11, l. 7; p. 12, ll. 19, 22; p. 18, l. 29; p. 19, l. 31; p. 22, l. 7; p. 23, l. 17; p. 26, ll. 20, 25; p. 30, l. 32) and repeatedly describes a "head" (e.g., Title; Abstract; p. 4, ll., 17, 19, 27; p. 7. l. 32; p. 8, ll. 3, 6, 7, 15; p. 10. ll. 26, 27, 31, 32; etc.), nowhere does the specification recite a "head substrate" or "head substrate (33)" as alleged by the Examiner.

Because the Examiner relies upon his fabricated "head substrate (33)" to create his allegation that the claims are "misdescriptive to the disclosed invention," the Examiner fails to present a *prima facie* case of indefiniteness. For at least this reason, the Section 112, paragraph 2 rejection of claims 23, 26 and 29 is improper and should be reversed.

Moreover, review of the application demonstrates that claims 23, 26 and 29 are far from "misdescriptive." As discussed and depicted in various parts of the specification and drawings, a transducer can be formed atop a major surface of a wafer substrate after an actuator has been formed atop the opposite major surface of the substrate, so that "no part of said substrate is disposed further than said transducer from said actuator." For example, the "SUMMARY OF THE INVENTION" on page 4 states, in part:

> In accordance with the present invention integrated head, flexure, gimbal and/or actuator devices formed on and from a wafer substrate are disclosed. Conventional problems of connecting the head to the flexure and/or gimbal are reduced or eliminated, as all of these elements may be made on and from the same wafer on which the transducer is formed... Additionally, ***a microactuator may be formed on an end of the structure furthest from the transducer layers***. (emphasis added)

Further support for dependent claims 23, 26 and 29 is found in the "ABSTRACT OF THE DISCLOSURE," which states:

> Devices for reading or writing electromagnetic information include a ***wafer substrate piece disposed between an electromagnetic transducer and an electrostrictive or piezoelectric actuator***. The substrate piece is shaped as a rigid body adjoining the transducer and as a flexible element connecting the body and the actuator. To fabricate, at least one ***electrostrictive layer and many transducers are formed on opposite sides of a wafer*** that is then cut into rows containing plural transducers. The rows are processed from directions generally normal to the ***wafer surface upon which the transducers were formed***, by removing material to form a head, flexures and a media-facing surface on the head. Conductive leads are formed on a back surface of flexures connecting the transducer with drive electronics. The flexures are aligned with forces arising from interaction with the media surface and from seeking various tracks, reducing torque and dynamic instabilities and increasing actuator access time.

FIGs. 3-4 depict the formation of "transducers 40 and 44" on a major surface of a "wafer substrate 100," as described in paragraphs [0045]-[0047]. The substrate 100 and attached transducers 40 and 44 can be cut into rows as shown in FIG. 5 and described in paragraph [0048], and then processed from an orthogonal direction "to form the desired media-facing surface, head, gimbal and flexure that are depicted in FIG. 1." *Id.* Such processing of the substrate 100 and transducers 40 and 44 is described in more detail in paragraphs [0048]-[0052], and shown in FIGs. 6 and 7, after which individual device 30

may be severed from the other devices of the row, resulting in the device shown in FIGs. 1 and 8.

More detailed explanations of the formation and operation of an actuator on an opposite side of a substrate from a transducer can be found in paragraphs [0067]-[0069], [0072]-[0076] and [0078]-[0082]. For instance, paragraph [0067] states, in part:

> FIG. 20 shows a device 400 including a piezoelectric layer 404 that may be employed to help position the device. Much of device 400 is like device 30 shown in FIG. 1, and so for brevity substantially similar elements will not be renumbered or discussed at this point. Much as above, device 400 is formed on and from a wafer substrate, but prior to formation of head elements on a major surface of the wafer, a conductive layer 408 is formed on a major surface of the wafer. The conductive layer 408 may be formed of a metal or conductive ceramic that adheres well to the wafer and to the piezoelectric layer 404 that is formed atop the conductive layer...

Appellant respectfully asserts that one of ordinary skill in the art would understand what a major surface of a wafer substrate is, and would understand from FIG. 20 that the head elements are formed atop an opposite major surface from the "piezoelectric layer 404 that is formed atop the conductive layer." Moreover, FIG. 3 explicitly depicts an embodiment of "head 33" in which "tranducers 40 and 44" are formed in multiple layers atop the "wafer substrate 100." See paragraphs [0045] – [0047]. Appellant respectfully asserts that one of ordinary skill in the art would not view FIG. 20 in isolation, especially because the text quoted above references earlier portions of the application, but states that "for brevity substantially similar elements will not be renumbered or discussed at this point."

In accordance with this explanation of the formation of an actuator on an opposite surface of a wafer substrate from a transducer, paragraph [0074] states, in part:

> Piezoelectric layer 505 is then formed atop conductive layer 502 to a thickness that may for example be in a range between about one micron and a few tens of microns, followed by annealing with an electric field provided between conductive layer 502 and an electrode, not shown, that may also provide the heat for annealing. After cooling and cleaning the wafer, ***the head elements are formed on an opposite surface of the wafer from layer 505***, followed by separating the wafer into rows and working the rows to create the media-facing surfaces, heads, flexures and leads, much as described above. (emphasis added)

Also in accordance with these explanations of the formation of an actuator on an opposite side of a substrate from a transducer, paragraph [0078] states, in part:

> FIG. 26 illustrates some initial steps in the formation of a laminated ***piezoelectric microactuator*** that may be attached to any of the head, flexure and conductor devices previously described, in similar fashion as device 500 shown in FIG. 24 and 25. A ***wafer substrate 600 has a first conductive layer 602 formed on an opposite major surface from that on which head elements will later be formed. A first piezoelectric layer 604 is formed on the first conductive layer 602***, followed by a second conductive layer 606, a second piezoelectric layer 608, a third conductive layer 610, and a third piezoelectric layer 612. (emphasis added)

The Final Rejection, however, ignores the remainder of the application to instead focus only on FIG. 1, which depicts transducer layers disposed atop a wafer substrate, albeit with less detail than the example shown in FIG. 3, and which does not depict an actuator formed on an opposite end of the substrate, unlike FIG. 20.

In addition to choosing to ignore the teachings of the present application, the Examiner is also choosing to ignore that which is well known to one of ordinary skill in the art. For example, the present application on page 1, lines 20-24 states:

> Conventional electromagnetic heads such as those employed in disk or tape drives are formed in a plurality of thin films on a substrate, after which the substrate is cut or diced. In this manner a single wafer may yield many hundreds of heads.

In brief, the Examiner's argument regarding a "substrate" and "transducer layers," while reasonable in some situations, ignores explicit teachings of the present application as well as ignoring knowledge of those of skill in the art of electromagnetic heads, in order to allege that claims 23, 26 and 29 are somehow indefinite.

2. Claim 26

Claims 23, 26 and 29 differ in that they depend from independent claims 1, 11 and 20, respectively. Claim 11 recites, in part:

> a wafer substrate piece disposed between an electromagnetic transducer and an electrostrictive actuator...

Claim 11 thus contradicts the Examiner's allegation that "the upper plane of head substrate (33) clearly and unambiguously lies 'above' the transducer layers (40) and (44), albeit slightly so," and demonstrates that the limitation in claim 26 that states "wherein no part of said substrate piece is disposed further than said transducer from said actuator" is not "misdescriptive to the disclosed invention" as alleged by the Examiner.

3. Claims 23 and 29

Claim 11 also demonstrates that the limitations of claims 23 and 29 that recite "wherein no part of said substrate is disposed further than said transducer from said actuator" are not "misdescriptive to the disclosed invention" as alleged by the Examiner.

As discussed above, the Examiner's Section 112, paragraph 2 rejection of claims 23, 26 and 29 hinges upon his statement that "the upper plane of head substrate (33) clearly and unambiguously lies 'above' the transducer layers (40) and (44), albeit slightly so." The fabricated "head substrate (33)" that the Examiner uses to create this rejection, while reasonable in some situations, is unreasonable in this case because the Examiner purposefully disregards various explicit teachings of the present application as well that which is known by those of ordinary skill in the art. For all the foregoing reasons, appellant respectfully asserts that the rejection of claims 23, 26 and 29 on 35 U.S.C. §112, ¶ 2 grounds is improper and should be reversed.

II. Regarding Grounds of Rejection (2), the Final Rejection states, on page 5:

> Claims 23, 26 and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
>
> As set forth, *supra*, as per newly presented claims 23, 26 and 29, the phrase "wherein ***no part*** of said substrate is disposed further than said transducer from said actuator" (emphasis added) is unsupported by Applicant's originally disclosed invention.
>
> More concretely as is clearly shown in FIG. 1, the head (33) includes portions that are located laterally and beyond/above (in terms of the positive "x" direction) the transducing elements within pad (50); as

> noted in Figure 1 of Applicant's disclosure, the upper plane of head substrate (33) clearly and unambiguously lies "above" the transducer layers (40) and (44).
>
> Moreover still the Applicant's original disclosure is completely silent with respect to "wherein no part of said substrate is disposed further than said transducer from said actuator" other than the Applicant's drawings, which are ambiguous at best in terms of this critical limitation.

Appellant respectfully but strongly disagrees with the Examiner's allegation that "the phrase 'wherein no part of said substrate is disposed further than said transducer from said actuator' is unsupported by Applicant's originally disclosed invention." In this rejection the Examiner again purposefully disregards much of the specification and drawings to fabricate a "head substrate (33)" that he relies on to allege that claims 23, 26 and 29 do not comport with 35 U.S.C. §112, ¶ 1.

> Compliance with § 112 requires sufficient information in the specification to show that the inventor possessed the invention at the time of that original disclosure. See *Vas-Cath*, 935 F.2d at 1561 ("Adequate description of the invention guards against the inventor's overreaching by insisting that he recount his invention in such detail that his future claims can be determined to be encompassed within his original creation."). The possession test requires assessment from the viewpoint of one of skill in the art. *Id.* at 1563-64 ("The applicant must . . . convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention." (emphasis in original)); *Union Oil Co. of Cal. v. Atl. Richfield Co.*, 208 F.3d 989, 997 (Fed. Cir. 2000) ("The written description requirement does not require the applicant 'to describe exactly the subject matter claimed, [instead] the description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.'" (citation omitted)).

Pandrol USA, LP v. Airboss Ry. Prods., 424 F.3d 1161, 1165 (Fed. Cir. 2005).

> The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language. *In re Edwards*, 568 F.2d 1349, 196 U.S.P.Q. (BNA) 465 (CCPA 1978); *In re Herschler*, 591 F.2d 693, 200 U.S.P.Q. (BNA) 711 (CCPA 1979).

In re Kaslow, 707 F.2d 1366, 1 (Fed. Cir. 1983).

Appellant respectfully but strongly disagrees with the Examiner's allegation that "Applicant's original disclosure is completely silent with respect to 'wherein no part of said substrate is disposed further than said transducer from said actuator' other than the Applicant's drawings, which are ambiguous at best in terms of this critical limitation." As noted above, the original "SUMMARY OF THE INVENTION" on page 4 states, in part:

> In accordance with the present invention integrated head, flexure, gimbal and/or actuator devices formed on and from a wafer substrate are disclosed. Conventional problems of connecting the head to the flexure and/or gimbal are reduced or eliminated, as all of these elements may be made on and from the same wafer on which the transducer is formed... Additionally, ***a microactuator may be formed on an end of the structure furthest from the transducer layers*** . (emphasis added)

Further support for dependent claims 23, 26 and 29 is found in the "ABSTRACT OF THE DISCLOSURE," which states:

> Devices for reading or writing electromagnetic information include a ***wafer substrate piece disposed between an electromagnetic transducer and an electrostrictive or piezoelectric actuator***. The substrate piece is shaped as a rigid body adjoining the transducer and as a flexible element connecting the body and the actuator. To fabricate, at least one ***electrostrictive layer and many transducers are formed on opposite sides of a wafer*** that is then cut into rows containing plural transducers. The rows are processed from directions generally normal to the ***wafer surface upon which the transducers were formed***, by removing material to form a head, flexures and a media-facing surface on the head. Conductive leads are formed on a back surface of flexures connecting the transducer with drive electronics. The flexures are aligned with forces arising from interaction with the media surface and from seeking various tracks, reducing torque and dynamic instabilities and increasing actuator access time.

FIGs. 3-4 depict the formation of "transducers 40 and 44" on a major surface of a "wafer substrate 100," as described in paragraphs [0045]-[0047]. The substrate 100 and attached transducers 40 and 44 can be cut into rows as shown in FIG. 5 and described in paragraph [0048], and then processed from an orthogonal direction "to form the desired media-facing surface, head, gimbal and flexure that are depicted in FIG. 1." *Id.* Such processing of the substrate 100 and transducers 40 and 44 is described in more detail in paragraphs [0048]-[0052], and shown in FIGs. 6 and 7, after which individual device 30

may be severed from the other devices of the row, resulting in the device shown in FIGs. 1 and 8.

More detailed explanations of the formation and operation of an actuator on an opposite side of a substrate from a transducer can be found in paragraphs [0067]-[0069], [0072]-[0076] and [0078]-[0082]. For instance, paragraph [0067] states, in part:

> FIG. 20 shows a device 400 including a piezoelectric layer 404 that may be employed to help position the device. Much of device 400 is like device 30 shown in FIG. 1, and so for brevity substantially similar elements will not be renumbered or discussed at this point. Much as above, device 400 is formed on and from a wafer substrate, but prior to formation of head elements on a major surface of the wafer, a conductive layer 408 is formed on a major surface of the wafer. The conductive layer 408 may be formed of a metal or conductive ceramic that adheres well to the wafer and to the piezoelectric layer 404 that is formed atop the conductive layer...

Appellant respectfully asserts that one of ordinary skill in the art would understand what a major surface of a wafer substrate is, and would understand from FIG. 20 that the head elements are formed atop an opposite major surface from the "piezoelectric layer 404 that is formed atop the conductive layer." Moreover, FIG. 3 explicitly depicts an embodiment of "head 33" in which "tranducers 40 and 44" are formed in multiple layers atop the "wafer substrate 100." See paragraphs [0045] – [0047]. Appellant respectfully asserts that one of ordinary skill in the art would not view FIG. 20 in isolation, especially because the text quoted above references earlier portions of the application, but states that "for brevity substantially similar elements will not be renumbered or discussed at this point."

In accordance with this explanation of the formation of an actuator on an opposite surface of a wafer substrate from a transducer, paragraph [0074] states, in part:

> Piezoelectric layer 505 is then formed atop conductive layer 502 to a thickness that may for example be in a range between about one micron and a few tens of microns, followed by annealing with an electric field provided between conductive layer 502 and an electrode, not shown, that may also provide the heat for annealing. After cooling and cleaning the wafer, ***the head elements are formed on an opposite surface of the wafer from layer 505***, followed by separating the wafer into rows and working the rows to create the media-facing surfaces, heads, flexures and leads, much as described above. (emphasis added)

Also in accordance with these explanations of the formation of an actuator on an opposite side of a substrate from a transducer, paragraph [0078] states, in part:

> FIG. 26 illustrates some initial steps in the formation of a laminated ***piezoelectric microactuator*** that may be attached to any of the head, flexure and conductor devices previously described, in similar fashion as device 500 shown in FIG. 24 and 25. A ***wafer substrate 600 has a first conductive layer 602 formed on an opposite major surface from that on which head elements will later be formed. A first piezoelectric layer 604 is formed on the first conductive layer 602***, followed by a second conductive layer 606, a second piezoelectric layer 608, a third conductive layer 610, and a third piezoelectric layer 612. (emphasis added)

Further, appellant respectfully asserts that the Examiner's particular interpretation of the "head 33" as "the substrate," while reasonable in some situations, is unreasonable in this rejection because it selectively ignores many teachings of the original specification to allege that the claims are "unsupported by Applicant's originally disclosed invention." For example, while the specification repeatedly describes a "substrate" (e.g., Title; Abstract; p. 4, l. 35; p. 7, l. 31; p. 8, ll. 2, 12; p. 10, l. 27; p. 11, l. 7; p. 12, ll. 19, 22; p. 18, l. 29; p. 19, l. 31; p. 22, l. 7; p. 23, l. 17; p. 26, ll. 20, 25; p. 30, l. 32) and repeatedly describes a "head" (e.g., Title; Abstract; p. 4, ll., 17, 19, 27; p. 7. l. 32; p. 8, ll. 3, 6, 7, 15; p. 10. ll. 26, 27, 31, 32; etc.), nowhere does the specification recite a "head substrate" or "head substrate (33)" as alleged by the Examiner.

The Final Rejection, however, ignores the remainder of the application to instead focus only on FIG. 1, which depicts transducer layers disposed atop a wafer substrate, albeit with less detail than the example shown in FIG. 3, and does not depict an actuator formed on an opposite end of the substrate, unlike FIG. 20.

Because the Examiner relies upon his fabricated "head substrate (33)" to create his allegation that the claims are "unsupported by Applicant's originally disclosed invention," the Examiner fails to present even a prima facie case of failure to provide written description. For at least this reason, the Section 112, paragraph 1 rejection of claims 23, 26 and 29 is improper.

In addition to choosing to ignore the teachings of the present application, the Examiner is also choosing to ignore that which is well known to one of ordinary skill in the art. For example, the present application on page 1, lines 20-24 states:

> Conventional electromagnetic heads such as those employed in disk or tape drives are formed in a plurality of thin films on a substrate, after which the substrate is cut or diced. In this manner a single wafer may yield many hundreds of heads.

The knowledge of those of ordinary skill in the art as well as the predictability of the art are both relevant to a written description inquiry. As noted in *Capon v. Eshhar*, 418 F.3d 1349, 1360 (Fed. Cir. 2005), which involved biotechnology that had previously been held to be unpredictable:

> The predictability or unpredictability of the science is relevant to deciding how much experimental support is required to adequately describe the scope of an invention. Our predecessor court summarized in *In re Storrs*, 44 C.C.P.A. 981, 245 F.2d 474, 478, 1957 Dec. Comm'r Pat. 361 (CCPA 1957) that "it must be borne in mind that, while it is necessary that an applicant for a patent give to the public a complete and adequate disclosure in return for the patent grant, the certainty required of the disclosure is not greater than that which is reasonable, having due regard to the subject matter involved."

"In determining the certainty required, it cannot be forgotten that the disclosure is not addressed to the public generally, but to those skilled in the art. *Mark v. Greenawalt*, 32 App.D.C. 253 (1908); *Mowry v. Whitney*, 81 U.S. 620 (1871)." *In re Storrs*, 44 C.C.P.A. 981, 986 (C.C.P.A. 1957).

In addition, as noted above, claim 11 recites, in part:

> a wafer substrate piece disposed between an electromagnetic transducer and an electrostrictive actuator...

Claim 11 thus further undermines the Examiner's allegation that "the upper plane of head substrate (33) clearly and unambiguously lies 'above' the transducer layers (40) and (44), albeit slightly so," and again contradicts the Examiner's allegation that "Applicant's original disclosure is completely silent with respect to "wherein no part of said substrate is disposed further than said transducer from said actuator" other than the Applicant's drawings." Claim 26, which recites "wherein no part of said substrate piece is disposed further than said transducer from said actuator," fits naturally with the recital in claim 11 of "a wafer substrate piece disposed between an electromagnetic transducer and an electrostrictive actuator." Claim 11 also provides support for the limitations of

claims 23 and 29 that recite "wherein no part of said substrate is disposed further than said transducer from said actuator."

As mentioned above, the Examiner's rejection of claims 23, 26 and 29 hinges upon his statement that "the upper plane of head substrate (33) clearly and unambiguously lies 'above' the transducer layers (40) and (44), albeit slightly so." The fabricated "head substrate (33)" that the Examiner uses to create this rejection, while reasonable in some situations, is unreasonable in this case because the Examiner purposefully disregards various explicit teachings of the present application as well that which is known by those of ordinary skill in the art. For all the foregoing reasons, appellant respectfully asserts that the rejection of claims 23, 26 and 29 on 35 U.S.C. §112, ¶ 1 grounds is improper and should be reversed.

Although the alleged obviousness of the claims is discussed below under the heading of 35 U.S.C. §103, it is interesting to note at this point that an indication of nonobviousness is evident from the Final Rejection's Section 112 rejections. That is, even an Examiner who has issued many patents in this area has such difficulty imagining the formation of a transducer on one side of a substrate and an actuator on an opposite side that he ignores the teaching of the specification and drawings to arrive at an interpretation he better understands.

III. Regarding Grounds of Rejection (3), the Final Rejection states, on pages 6 and 7:

> As per claims 1 and 20, Harada et al. (JP 035230 A) discloses a device for reading or writing information (see FIG. 1 – disk drive), the device comprising: an electromagnetic transducer (magnetic head 1, which includes electromagnetic transducing element – solid layers of an electromagnetic induction element 11 and magnetoresistive element 12 – see paragraph [0029] of previously enclosed English machine translation) including a plurality of solid transducer layers of the induction head (11) and/or the layers of the magnetoresistive head (12), a substrate (e.g., slider (2) and unitary integral flexures (3,3)) adjoining said transducer (1), said substrate (2,3) shaped as a rigid body (slider portion which directly adjoins the transducer (1)) adjacent to said transducer (1) and as a plurality of flexible elements (3) distal to said transducer (1) (e.g., see FIGS. 3, 4 and 5), and an actuator – actuation means as per claim 20 (e.g., portion of load arm between elements (7) which magnetically interacts with (7) to rotationally position the slider (2) to a selected track of the disk (6)) attached (i.e., fastened, or secured or joined to) to said substrate (2

including flexing elements (3)) distal to said transducer (1) (via (4) and/or (5)). Note the Examiner has interpreted the term "attached" as encompassing non-direct contact. For example, two objects can be considered as being "attached" (or for that matter "joined" or "secured" or "fastened") to each other by an intervening element, such as resin or glue bonding the two objects together, without requiring direct contact between the two objects.

A. Harada is Nonenabled

As an initial matter, appellant objects to Harada as being nonenabled. To invalidate a claim for anticipation or obviousness, a prior art reference must be enabling. "That prior art patents may have described failed attempts or attempts that used different elements is not enough. The prior art must be enabling. *See Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1471, 43 USPQ 2d 1481, 1489 (Fed. Cir. 1997) ("In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method." (*quoting Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551, 13 USPQ 2d 1301, 1304 (Fed. Cir. 1989)))." *Rockwell Int'l Corp. v. United States*, 147 F.3d 1358, 1365 (Fed. Cir.1998). See also *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1558 (Fed. Cir. 1985), which states: "The 'failed' experiment reported in the prosecution history of the Mason patent renders that patent irrelevant as a prior art reference. As stated by Judge Learned Hand, 'another's experiment, imperfect and never perfected will not serve either as an anticipation or as part of the prior art, for it has not served to enrich it.' *Picard v. United Aircraft Corp.*, 128 F.2d 632, 635 (2d Cir. 1942), *cert. denied*, 317 U.S. 651, 87 L. Ed. 524, 63 S. Ct. 46, (1942)."

Harada, which was withdrawn rather than examined, notes that: "This document has been translated by computer. So the translation may not reflect the original precisely." More to the point, the "English machine translation" of Harada is in many places impossible to understand and/or absurd. Whether this is due to poor translation or deficiencies and contradictions in the original document is unclear. What is clear, however, is that Harada's description and drawings would not enable one of ordinary skill in the art to make and use the invention claimed by Harada, and would be further removed from enabling one of such skill to make and use the claims at issue.

For example, Harada states in paragraphs [0020] and [0028], respectively, that "said junction " and "electrical wiring 4" "defecates the front face of the field joined by the inactive atom or ion beam etching in a vacuum or a clarification ambient atmosphere chamber." Harada further states in paragraph [0021] "an erector with a gimbal can install the minute magnetic head and the minute slider section at the tip of a magnetic-head support means more nearly nothing." Similarly, paragraphs [0014] – [0018] of Harada each state: "the magnetic head of the shape of a thin film installed so that it might become abbreviation parallel to a magnetic-recording medium, The pneumatic bearing formed as supported said magnetic head and projected toward the magnetic-recording medium (slider), The electric wiring which outputs and inputs an electrical signal to the magnetic head, It has the magnetic-head slider, the electric wiring, and the arm unification magnetic-head support means which really formed the metal supporter material (arm) which determines the relative position to the magnetic-recording medium of the magnetic head, and constituted it from a single crystal silicon substrate of the same material." Although Harada abounds with further examples of curious or absurd statements, suffice it to say that nearly every paragraph if not every sentence of that reference contains statements whose meaning would have been unclear to one of ordinary skill in the art.

Moreover, much of that which is discernable from Harada is self contradictory. For example, Harada teaches in paragraph [0031] of "..contact hole 21 punched by penetrating a slider 2 from there..." One of ordinary skill in the art would expect that "contact hole 21" could not be punched with head 1 attached. Yet Harada does not indicate how to make thin film "magnetic head 1," which according to paragraph [0029], "the dimension of the thickness direction was expanded and exaggerated" in drawing 3, or how to join those delicate thin films to "slider 2." For example, Harada does not disclose what adhesive would be used for that joining, and how could that adhesive allow electrical conduction between "contact hole 21" and "electrode terminal 13" without also providing electrical conduction between all four of the leads ("Electric wiring 4") shown in drawing 4. If instead heat and/or an applied electric field were to be used to join the "magnetic head 1" to "slider 2," one of ordinary skill in the art would expect that the thin films of the head would be destroyed.

Other contradictions of Harada are also facially evident. For instance, in paragraph [0025] Harada states: "A magnetic-head support device consists of the gimbal 3, the electric wiring 4, and the arm 5 for holding the magnetic head 1, a slider 2, and its posture, and from the magnetic head 1 to the electric wiring 4 is fabricated by the solid configuration with a micro processing technique from a silicon single crystal substrate. On the other hand, in order for appearance processing of the arm 5 to be carried out by photoetching processing which used the metal and to raise flexural rigidity, a part of side edge section to a longitudinal direction is fabricated by bending." How is it possible that "from the magnetic head 1 to the electric wiring 4 is fabricated by the solid configuration with a micro processing technique from a silicon single crystal substrate"? Moreover, it is not possible to reconcile drawing 2 with drawings 4 and 5, although each is said by Harada to represent the same "1st example." For example, the "sectional view" of drawing 2 shows "gimbal 3" connected to "slider 2," yet the "perspective view" of the same example in drawings 4 and 5 instead shows a space between "gimbal 3" and "slider 2," for any lengthwise cross-section that intersects "head 1." For at least these reasons Harada is nonenabled and cannot be used as prior art.

The Final Rejection on pages 17 and 18 responds to the various reasons explained above as to why Harada is nonenabled by simply claiming, albeit "vigorously," that Harada is enabled. The Final Rejection, however, offers no answer to myriad examples of Harada's generally unintelligible nature and various contradictions that were detailed by appellant in the prior response. Indeed, appellant respectfully asserts that one of ordinary skill in the art who had reviewed Harada would have been so confused by that reference that one of such skill would have been discouraged from trying anything that at all resembles Harada. Moreover, appellant finds it amazing that the Final Rejection can simultaneously allege that Harada is enabled and that certain claims of the present application do not have adequate support under Section 112.

B. Harada Does Not Teach Several Limitations of the Rejected Claims

1. Claims 1 and 20

Assuming arguendo that Harada is enabled, appellant respectfully disagrees with the Final rejection statement that "paragraph [0029]" of Harada discloses "a plurality of

solid transducer layers of the induction head (11) and/or the layers of the magnetoresistive head (12)." Paragraph [0029] of Harada does not describe plural layers of the magnetoresistive head (12), but rather describes drawing 3, which does not depict magnetoresistive head (12) at all. For at least this reason, the Examiner has not presented a *prima facie* case of anticipation of claim 1 or claim 20 by Harada.

Appellant further respectfully disagrees with the Final Rejection statement that Harada discloses "an actuator... attached (i.e., fastened, or secured or joined to) to said substrate ... (via (4) and/or (5))." Drawings 3, 4 and 5 do not show an actuator. In drawings 1 and 2, "arm 5" of Harada does not extend to connect with "actuator 7." Even if, *assuming arguendo*, "arm 5" did extend to connect with "actuator 7," it is clear that "arm 5" is not connected with "substrate 2." Moreover, should "electric wiring 4" extend to connect with "actuator 7," as asserted in the Final Rejection, signal errors would be expected due to the changing voltage, current and magnetic field in the actuator. Such a debilitating signal error provides yet another reason why Harada is nonenabled. In short, Harada does not disclose that "actuator 7" is attached to "substrate 2" as proposed by the Final Rejection.

The Final Rejection responds on page 18 to the preceding paragraph (which is essentially reproduced from appellant's prior response) by rewriting that paragraph, stating instead:

> The Applicants somehow alleges that Harada et al. (JP 9-035230 A) fails to disclose an "actuator."

Appellant also notes that the Examiner appears to be either rewriting Harada or interpreting "attached" as encompassing more than "non-direct contact." That is, Harada calls element 7 an actuator, as noted by the Final Rejection on page 18, which states:

> The Examiner directs the Applicant's attention to, *inter alia*, paragraph [0024] of Harada et al. (JP 9-035230 A) and to FIG. 1, 2 and 6. ***As is clearly depicted in such Figures, the actuator is represented by designator (7)***. (emphasis added)

Because the Final Rejection refers to a drawing that does not contain what the Final Rejection says it contains, fails to provide a reason that Harada shows "an actuator... attached (i.e., fastened, or secured or joined to) to said substrate," and

contradicts itself in stating that "designator (7)" is in "non-direct contact," the Examiner has failed to present a *prima facie* case of anticipation of claim 1 or claim 20 by Harada.

2. Claim 20

Claim 20, unlike claim 1, in part recites "actuation means for positioning said transducer." The Final Rejection, however, does not distinguish claim 20 from claim 1, despite the "means-plus-function" clause in claim 20. In particular, the Examiner disregards the structure disclosed in appellant's specification corresponding to the "means-plus-function" clause in claim 20 in rendering his opinion that claim 20 is not patentable. Because the Examiner does not even attempt to show that the structure corresponding to the "means for" clause in claim 20 is anticipated by Harada, the Final Rejection has not even attempted to present a *prima facie* case of anticipation of claim 20.

Moreover, claim 20 in part recites "said actuation means attached to said substrate distal to said transducer." Appellant agrees with the Examiner that, "As is clearly depicted in such Figures, the actuator is represented by designator (7)." Appellant respectfully asserts, however, that Harada does not disclose that "actuator 7" is attached to "substrate 2" as proposed by the Final Rejection, and further does not teach "actuation means attached to said substrate distal to said transducer." For this reason also, the Examiner has not presented a *prima facie* case of anticipation of claim 20 by Harada.

3. Claim 7

Regarding claim 7, the Final Rejection states:

> As per claim 7, wherein said rigid body (2) has a media-facing-surface (e.g., see FIG. 2) separated from a back surface (e.g., upper surface of (2) on which (4) resides – see FIG. 3) in a Z-direction, and at least a portion of said flexible elements (3) is disposed at a Z-height between said surfaces.

Appellant respectfully asserts that it appears from drawings 2 and 3 of Harada that "slider 2" does not have a "media-facing-surface" as alleged by the Final Rejection, but is instead covered by "magnetic head 1." For at least this reason, the Final Rejection has failed to present a *prima facie* case of anticipation of claim 7.

4. Claim 8

Regarding claim 8, the Final Rejection states:

> As per claim 8, wherein said flexible elements (3) are aligned ***substantially*** with a plane, and said rigid body (2) and said actuator are intersected by said plane.

Appellant respectfully asserts that it appears from drawing 5 of Harada that "gimbal 3" may be aligned substantially with a plane, but that "slider 2" is not intersected by that plane. For at least this reason, the Final Rejection has failed to present a *prima facie* case of anticipation of claim 8.

5. Claim 9

Regarding claim 9, the Final Rejection states:

> As per claim 9, wherein said rigid body (2) has a media-facing-surface (surface of (2) closest to disk (6)) separated from a back surface (back surface of (2) which is contacted by (4)), and said back surface has a protrusion extending away from said media-facing surface (e.g., portion of (21) which rises through and above (2) to form portion (4), which is in a plane above [thus a prtotrusion] above the back surface of (2) as seen in FIG. 3).

Appellant respectfully asserts that it appears from drawings 2 and 3 of Harada that "slider 2" does not have a "media-facing-surface" as alleged by the Final Rejection, but is instead covered by "magnetic head 1." For at least this reason, the Final Rejection has failed to present a *prima facie* case of anticipation of claim 9. In addition, because "slider 2" does not have a "media-facing-surface," a protrusion cannot rise from a nonexistent "media-facing-surface." For this reason also, the Final Rejection has failed to present a *prima facie* case of anticipation of claim 9.

6. Claims 21, 24 and 27

Regarding claims 21, 24 and 27, the Final Rejection states:

> As per claims 21 and 27 (and also claim 24, rejected *infra*), wherein said flexible elements (3) extend substantially parallel to a first plane (e.g., the plane in which the elements (3) lie) and said transducer layers are substantially parallel to a second plane that is perpendicular to

said first plane. Note that the actual "transducing" performed by the head of Harada et al. (JP 9-035230 A) is at the pole tips and fringing gap located proximate designator (113) in FIG. 3, and that these nearly vertical pole tip layers are substantially (although not quite) vertical in FIG. 3. Thus, clearly it can be said that the "transducing layers" are substantially parallel to a second plane that is perpendicular to the plane encompassing the flexures (3).

As noted above, Harada is not enabled to teach "flexible elements (3)" because it is not possible to reconcile drawings 2 and 3 with drawings 4 and 5, although each is said by Harada to represent the same "1st example." For example, the "sectional view" of drawing 3 shows "gimbal 3" connected to "slider 2," yet the "perspective view" of the same example in drawings 4 and 5 instead shows a space between "gimbal 3" and "slider 2," for any lengthwise cross-section that intersects "head 1." For at least this reason Harada is nonenabled and cannot be used as prior art to show a "flexible element 3" having any orientation relative to the "transducer layers" alleged by the Final rejection.

In addition, Harada does not teach, and it would not have been evident to one of ordinary skill in the art, how to make the "transducer layers" alleged by the Final rejection. Appellant respectfully asserts that one of ordinary skill in the art could not explain, with reference to support in Harada, exactly how the unconventional "head 1" of Harada would be made. In particular, how are the layers adjacent to "gap 113" that are asserted by the Examiner to be "substantially vertical" made to terminate at the corner of "head 1" adjacent to vertical and horizontal edges of "head 1" as shown in FIG. 3? Paragraph [0030] of Harada teaches "the magnetic head of the planar method installed in parallel with the flat surface," implying that the "head 1" is built in layers that are parallel to layer 112, exacerbating the difficulty in explaining the construction of the layers that terminate adjacent "gap 113."

For at least these reasons, the Final Rejection has failed to present a *prima facie* case of anticipation of claims 21, 24 or 27.

7. Claims 22, 25 and 28

Regarding claims 22, 25 and 28, the Final Rejection states:

As per claims 22 and 28 (and also claim 25, rejected *infra*), wherein said transducer layers (see FIG. 3) include a plurality of active

layers (e.g., the transducing pole layers of the head as seen in FIG. 3) that convert a magnetic signal to an electrical signal (via the electrical coils (111)), said active layers separated from said substrate (2) by a plurality of inactive layers (including the layers of the substrate (1), the undepicted but necessarily present gap layers and insulative layers surrounding the electrical coils (111) and the top layer of (111) covering the top pole as seen in FIG. 3 of Harada et al. (JP 9-035230 A), that do not convert between magnetic and electrical signals.

The Examiner in this rejection has stated essentially that Harada teaches "active layers separated from said substrate (2) by a plurality of inactive layers (including the layers of the substrate (1)." None of claims 22, 25 and 28 recites more than one substrate, however. Moreover, by labeling "magnetic head 1" the substrate the Examiner is ignoring limitations of independent claims 1, 11 and 20 that recite that the substrate (or substrate piece) has a flexible element or elements.

For at least these reasons, the Final Rejection has failed to present a *prima facie* case of anticipation of claims 22, 25 or 28.

IV. Regarding Grounds of Rejection (4), the Final Rejection states, on pages 14 and 15:

> Claims 21-23 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tokuyama et al. (US 5,57,573).
>
> As per claims 1 and 20, Tokuyama et al. (US 5,57,573) discloses a device (e.g., FIG. 1) for reading or writing information (to a disk (1)), the device comprising: an electromagnetic transducer (2) including a plurality of solid transducer layers (as is necessarily required), a substrate (30) see, *inter alia*, COL. 12, lines 52-63- adjoining said transducer, said substrate (30) shaped as a rigid body (portion of slider that is the air bearing and is not flexed as seen, e.g., in FIGS. 5 and/or 6 and/or 7 and/or 23 and/or 24, etc.) adjacent to said transducer (2) and as a plurality of flexible elements (plurally divided portions of (30) which flexes as seen, e.g., in FIGS. 23, 24, etc.) distal to said transducer, and an actuator (12) (actuation means as per claim 20) attached to said substrate (30) distal to said transducer (2).
>
> As per claim 21 and 27, wherein said flexible elements extend substantially parallel to a first plane and said transducer layers (e.g., see vertical-to-air-bearing-surface orientation in FIGS. 22 and 23) are substantially parallel to a second plane that is perpendicular to said first plane.
>
> As per claims 22 and 28, wherein said transducer layers include a plurality of active layers (e.g., the requisite and inherently required poles of transducer (2)) that convert a magnetic signal to an electrical signal,

said active layers separated from said substrate (30) by a plurality of inactive layers (e.g., the insulative layers that form the substrate and/or requisite transducing gap fringing layer of head (2)) is the substrate that do not convert between magnetic and electrical signals.

As per claims 23 and 29, wherein no part of said substrate (30) is disposed further than said transducer (2) from said actuator (12).

Initially note that the Final Rejection rejected claims 21-23 and 27-29 as allegedly being anticipated by Tokuyama, and begins by discussing claims 1 and 20. In a similar manner, appellant's response begins by discussing claims 1 and 20, even though claims 1 and 20 have not been rejected. Also note:

> Anticipation under § 102 requires "'the presence in a single prior art disclosure of all elements of a claimed invention ***arranged as in that claim***.'" *Carella v. Starlight Archery & Pro Line Co.*, 804 F.2d 135, 138, 231 U.S.P.Q. (BNA) 644, 646 (Fed. Cir. 1998) (quoting *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 1101, 227 U.S.P.Q. (BNA) 337, 350 (Fed. Cir. 1985)) (additional citations omitted). (emphasis added)

Sandt Tech., Ltd. v. Resco Metal & Plastics Corp., 264 F.3d 1344, 1350 (Fed. Cir. 2001). See also *Brown v. 3M*, 265 F.3d 1349, 1351 (Fed. Cir. 2001); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383, 58 U.S.P.Q.2D (BNA) 1286, 1291 (Fed. Cir. 2001); *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2D (BNA) 1001, 1010 (Fed. Cir. 1991). *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984).

1. Claim 1

Regarding claim 1, appellant respectfully disagrees with the Examiner that Tokuyama discloses "an actuator (12) ... attached to said substrate (30) distal to said transducer (2)." Appellant respectfully asserts that "actuator 12" is not attached to "support 3" or "suspension 30."

2. Claim 20

Claim 20 in part recites "actuation means for positioning said transducer." Appellant respectfully asserts that "actuation means 12" does not teach the structure disclosed in appellant's specification corresponding to the "means-plus-function" clause

in claim 20. Instead, actuator 12 of Tokuyama appears to be a conventional rotary actuator. In addition, appellant respectfully asserts that "actuator 12" as shown in FIG. 1 is not attached to "support 3" or "suspension 30."

3. Claims 1 and 20

Regarding both claims 1 and 20, appellant respectfully disagrees with the Final Rejection statement that Tokuyama discloses "a plurality of solid transducer layers (as is necessarily required)." As noted on page 4 of appellant's Request for Reconsideration filed December 3, 2003, a transducer can be formed with an iron core mounted on the trailing end of a slider. Moreover, as stated on page 4 of that Request for Reconsideration:

> A horseshoe magnet wound with a coil of wire will operate as suggested by the Final Rejection, and only includes a single layer. Moreover, perpendicular recording does not require more than one pole layer, although often a return pole layer is included. For example, U.S. Patent No. 4,286,299 to Shirahata et al. teaches that a magnetic head may have a single magnetic core layer around which is wrapped a winding carrying the recording current for vertical magnetization.

As stated in *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1268-1269 (Fed. Cir. 1991):

> To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Oelrich*, 666 F.2d 578, 581, 212 U.S.P.Q. (BNA) 323, 326 (CCPA 1981) (quoting *Hansgirg v. Kemmer*, 26 C.C.P.A. 937, 102 F.2d 212, 214, 40 U.S.P.Q. (BNA) 665, 667 (CCPA 1939)) provides:
>
> Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. [Citations omitted.] If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

See also *Toro Co. v. Deere & Co.*, 355 F.3d 1313 1320-1321 (Fed. Cir. 2004); *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003).

In addition, appellant respectfully disagrees with the Examiner's assertion that Tokuyama teaches:

> ...substrate (30) shaped as a rigid body (portion of slider that is the air bearing and is not flexed as seen, e.g., in FIGS. 5 and/or 6 and/or 7 and/or 23 and/or 24, etc.) adjacent to said transducer (2) and as a plurality of flexible elements (plurally divided portions of (30) which flexes as seen, e.g., in FIGS. 23, 24, etc.) distal to said transducer...

None of the figures of Tokuyama, including those cited by the Final Rejection, show these elements of claim 1 or claim 20 ***arranged as in those claims***. For instance, FIGs. 5 and 6 do not show "a plurality of flexible elements," in contrast to claim 1 and claim 20. Similarly, FIGs. 23 and 24 do not show a "substrate shaped as a rigid body adjacent to said transducer," in contrast to claim 1 and claim 20.

4. Claims 21 and 27

Regarding claims 21 and 27, appellant respectfully disagrees with the Final Rejection assertion that Tokuyama discloses "a plurality of solid transducer layers (as is necessarily required)." Appellant respectfully asserts, as discussed above and in the Request for Reconsideration, that Tokuyama does not necessarily require "a plurality of solid transducer layers," and so those layers are not inherent in Tokuyama. It is telling that the Examiner cannot point to those layers.

5. Claims 22 and 28

Regarding claims 22 and 28, appellant reiterates that Tokuyama does not necessarily require "a plurality of active layers." Appellant also respectfully asserts that "magnetic head 2" is not necessarily separated from the "support 3" or "suspension 30" by a plurality of inactive layers.

For at least the foregoing reasons, the Examiner has failed to present a *prima facie* case of anticipation of any claims by Tokuyama.

V. Regarding Grounds of Rejection (5), the Final Rejection states, on pages 14 and 15:

Claims 2-4, 11-14, 17, 19, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No. 36, Iss. No. 2, pp. 379-380, published February 1, 1993.

See the discussion of Harada et al. (JP 9-035230 A), *supra.*

As per claim 14, see the discussion of claim 8, *supra.*

As per claim 17, see the discussion of claim 9, *supra.*

As per claim 24, see the discussion of claim 21 and 27, *supra.*

As per claim 25, see the discussion of claim 22 and 28, *supra.*

With regard to claims 2-4, 11 and 12, Harada et al. (JP 9-035230 A) remains silent with respect to the aforementioned actuator including a layer or layers of piezoelectric material (i.e., an electrorestrictive actuator as per claim 11).

Such piezoelectric layers (as well as actuators used in the type of disk drive disclosed in Harada et al. (JP 9-035230)) are well known in the art, however.

As just one example, IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No 36, Iss. No. 2, pp. 379-380, published February 1, 1993 (referred to hereinafter as IBM TDB), discloses a rotary type actuator used in an analogous type of disk drive as that of Harada et al. (JP 9-035230 A), wherein the corresponding actuator used within the IBM TDB includes a piezoelectric layer/layers (i.e., an electrorestrictive actuator) formed as part of a piezoelectric actuator, in lieu of the conventional type rotary actuator. The IBM TDB uses such a piezoelectric actuator in lieu of the conventional type rotary actuator in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

Additionally, as per claim 19, wherein the actuator of the IBM TDB includes means ("certain voltage applied to the piezo(s)" – see description of the IBM TDB), for providing electrical voltage to said piezoelectric i.e., electrorestrictive) actuator.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230 A).

The rationale is as follows: one of ordinary skill in the art at the time of the invention was made would have been motivated to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230 A) in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

A. IBM TBD is Nonenabled

Like Harada, the IBM TDB cited by the Final Rejection is nonenabled, albeit for different reasons. One problem with the IBM TDB is the requirement that, in order to use "piezo A" to move the "head" as alleged in lines 27-34 of page 1 and shown by arrow "A" of Fig. 1, the "stage" structure surrounding "piezo B" must be free to rotate about the "pivot," and "piezo B" must also be free to rotate. Therefore, expansion of "piezo B" would not, in this case, move the "head" as shown by arrow "B" of Fig. 1.

Similarly, to move the "head" by "piezo B" as shown by arrow "B" of Fig. 1, "piezo A" and the arms and other structure surrounding "piezo A" must be free to move. In this case, instead of moving the "head" as alleged in lines 27-34 of page 1 and shown by arrow "A" of Fig. 1, "piezo A" and the arms and other structure surrounding "piezo A" would be expected to move. It is at best unclear how such an inherent conflict between "piezo A" and "piezo B" would be resolved. Thus, one of ordinary skill in the art would expect the IBM TDB to provide some unknown and unpredictable amount of actuation to the head, thwarting the actuator's essential purpose of accessing specific tracks on the medium.

Note further that the "long stroke movement" of IBM TDB is stated to be achieved by mechanical multiplication of the piezoelectric movement by a factor of one thousand (p. 1, ll. 35-38). In other words, any error or inaccuracy in the long stroke actuator of the IBM TDB is multiplied by a factor of one thousand at the head, likely leading to intolerable errors. Even so, this "long stroke movement" only achieves a range of one centimeter (p. 1, ll. 37-38), requiring at least two such long stroke actuators (along with additional actuators, suspensions and heads) for even the small disk surface shown.

Compounding this problem is the realization, as discussed above, that the "fine movement" alleged to be provided by "piezo B" is incompatible with the "long stroke movement" alleged to be provided by "piezo A." Note that even the "fine movement" actuation would multiply errors by a factor of twenty (p. 1, ll. 36-37), and that both "fine movement" and "long stroke movement" would multiply the unpredictable actuation discussed above.

Moreover, it is unclear how the limited long stroke actuation described in the IBM TDB would even allow the disk drive depicted in Fig. 2 of that disclosure to be

fabricated. For example, while it may be possible for the head and suspension designed for interaction with the outer zone ("ZONE – 2") of the disk to be moved beyond the circumference of the disk to allow drive fabrication, this would presumably require even greater mechanical multiplication and greater errors. On the other hand, it is not at all clear how the head and suspension designed for interaction with the inner zone ("ZONE – 1") of the disk could be moved beyond the circumference of the disk during fabrication, as this would seem to require more than double the limited range of actuation provided.

In addition, the IBM TDB does not disclose, and it would not have been evident to one of ordinary skill in the art, how to write on and read from the other major surface of the disk of that disclosure. Note that at least an additional pair of heads and suspensions would be needed for this essential feature of a modern disk drive, and each head and suspension would require an additional pair of actuators. Cramming the additional actuators on the same side of the disk as the actuators that are shown would seem to interfere with the additional heads and suspensions that would need to be located on that side of the disk. Reducing the size of the actuators in order to avoid such interference is contradicted by the meager large stroke motion allegedly provided by the actuators shown, which require mechanical multiplication of one thousand times in order to provide movement that, as discussed above, is still inadequate. In addition, attempts to reduce the actuator size would require greater mechanical multiplication and create even more errors.

Attempting to provide additional actuators on the opposite side of the disk from the actuators shown would exacerbate these difficulties. Placing the actuators in the corners directly across from the actuators shown would destroy the ability of all the original heads and suspensions as well as all the additional heads and suspensions to function, as the suspensions on each side would need to be in the same place as the actuators on the other side. On the other hand, placing the actuators in the corners across and ninety degrees from the actuators shown would destroy the functioning of both the original heads and suspensions designed for accessing the outer zone and the additional heads and suspensions designed for accessing the outer zone, as the outer heads and suspensions on each side would need to be in the same place as the actuators on the other side.

In addition, the inability of the head and suspension designed for interaction with the inner zone of the disk to be moved beyond the circumference of the disk during fabrication, as mentioned above, would make fabrication intractable should such an inner zone head and suspension be required for the other surface of the disk.

For at least the above reasons, the IBM TDB is nonenabled and is therefore not prior art that can be used in an obviousness rejection. It is easy to see why the IBM TDB was apparently not considered worthy of a patent application, despite the large numbers of patents issued in disk drive art to IBM.

The Final Rejection on page 18 responds to the argument that the IBM TDB is nonenabled by simply claiming, albeit "strenuously," that the IBM TDB is enabled. The Final Rejection, however, offers no answer to the various reasons that were detailed by appellant in the prior response explaining why the IBM TDB would be recognized as unworkable by one of ordinary skill in the art.

B. One of Ordinary Skill Would Not Have Modified Harada with IBM TDB

Furthermore, *assuming arguendo* that the IBM TDB is somehow enabled, one of ordinary skill in the art would not have been motivated to provide the actuator of the IBM TDB in lieu of the conventional actuator of Harada due to the many problems the IBM TDB, as discussed above. In addition, even the attributes alleged by the IBM TDB would not have been believed by one of ordinary skill in the art. For example, the reduced volume allegedly offered by the IBM TDB is contradicted by the discussion above, which points out that the IBM TDB does not provide the possibility of storage on both sides of the disk, and so the IBM TDB requires an additional drive for the same amount of storage, increasing rather than reducing the volume. Similarly, the arms shown in Fig. 1 of the IBM TDB would need to be thin and therefore fragile to provide even the minimal actuation alleged at the low voltage levels of a disk drive, and the bending of those arms to allow for that minimal actuation would weaken the arms over time, decreasing rather than increasing shock resistance.

Moreover, the combination of large errors despite limited actuation would have dissuaded one of ordinary skill in the art from employing the IBM TDB in a disk drive, which is perhaps the reason the IBM TDB was apparently never fabricated, used or even

considered worthy of a patent application. As noted in *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992): "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." Of course, due to the many problems of Harada, some of which are discussed above, one of ordinary skill would not have looked to Harada in the first place.

1. Claim 2

With regard to claim 2, appellant respectfully asserts that a strong disincentive would have been apparent to one of ordinary skill in the art to modify Harada with the IBM TDB, as the self-laudatory statements of lines 44-47 of the IBM TDB would have been dismissed as incorrect at best by one of such skill, who would have realized the unworkable problems of the IBM TDB. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 2 over Harada in view of the IBM TDB.

2. Claim 3

With regard to claim 3, appellant respectfully asserts that it is unclear whether the IBM TDB "piezo elements" include layers, let alone whether any such layers would be parallel to anything else. Part of this confusion may stem from the nonenabled IBM TDB's failure to provide any conductors for the "piezo elements." The angle of the "suspension" shown in Fig. 1 of the IBM TDB would suggest that neither "piezo-A" nor "piezo-B" has any layer parallel to any layer in the "head." Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 3 over Harada in view of the IBM TDB.

3. Claim 4

With regard to claim 4, appellant respectfully asserts that it is unclear whether the IBM TDB's "piezo elements" include layers. Moreover, "piezo-A" and "piezo-B"

appear to be incompatible, as noted above, and so it is very unlikely that the modification of Harada proposed by the Final Rejection would include a plurality of layers of piezoelectric material. Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 4 over Harada in view of the IBM TDB.

4. Claim 11

With regard to claim 11, appellant respectfully asserts that neither Harada nor IBM TDB teaches or suggests "a wafer substrate piece" as recited in that claim. Moreover, appellant respectfully asserts that neither Harada nor IBM TDB teaches or suggests "a flexible element connecting said rigid body and said actuator" as recited in claim 11. In addition to these nonobvious differences, the claim 11 is materially different than Harada in various ways besides Harada's lack of a piezoelectric actuator, as explained above with reference to the lack of anticipation and enablement of Harada. Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 11 over Harada in view of the IBM TDB.

5. Claim 12

With regard to claim 12, appellant respectfully asserts that it is unclear whether either of the IBM TDB "piezo elements" is shaped as a layer. One reason for this lack of clarity may be the IBM TDB's failure to provide any conductors for the "piezo elements." Another reason for this lack of clarity may be the nonenabled IBM TDB's failure to provide a description of an operable device, so that guessing at features is plagued by uncertainty as to whether the features are supposed to work or not. Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 12 over Harada in view of the IBM TDB.

6. Claim 13

With regard to claim 13, appellant respectfully asserts that it is unclear whether the IBM TDB "piezo elements" include layers, let alone whether any such layers would be parallel to anything else. Part of this confusion may stem from the nonenabled IBM TDB's failure to provide any conductors for the "piezo elements." The angle of the "suspension" shown in Fig. 1 of the IBM TDB would suggest that neither "piezo-A" nor "piezo-B" has any layer parallel to any layer in the "head." Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 13 over Harada in view of the IBM TDB.

7. Claim 14

With regard to claim 14, appellant respectfully asserts that it appears from drawing 5 of Harada that "gimbal 3" may be aligned substantially with a plane, but that "slider 2" is not intersected by that plane. Appellant respectfully asserts that it is unclear whether the IBM TDB "piezo elements" would be intersected by such a plane, assuming arguendo that one of ordinary skill in the art would have modified the nonenabled Harada with the inoperable IBM TDB. Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 14 over Harada in view of the IBM TDB.

8. Claim 17

With regard to claim 17, appellant respectfully asserts that it appears from drawings 2 and 3 of Harada that "slider 2" does not have a "media-facing-surface" as alleged by the Final Rejection, but is instead covered by "magnetic head 1." In addition, because "slider 2" does not have a "media-facing-surface," a protrusion cannot rise from a nonexistent "media-facing-surface." The IBM TDB does not correct for this failure to teach or suggest the limitations of claim 17. Moreover, one of ordinary skill in the art

would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 17 over Harada in view of the IBM TDB.

9. Claim 19

No reason for the Final Rejection of claim 19 has been offered, probably because the IBM TDB is completely devoid of teaching "means for providing electrical voltage to said actuator," and such means would be difficult to imagine given the freedom of movement required of "piezo-A" and "piezo-B." Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 19 over Harada in view of the IBM TDB.

10. Claim 24

With regard to claim 24, appellant respectfully asserts that it is unclear whether the IBM TDB "piezo elements" include layers, let alone whether any such layers would be parallel to anything else. Part of this confusion may stem from the nonenabled IBM TDB's failure to provide any conductors for the "piezo elements." The angle of the "suspension" shown in Fig. 1 of the IBM TDB would suggest that neither "piezo-A" nor "piezo-B" has any layer parallel to any layer in the "head." Moreover, one of ordinary skill in the art would have been disincented to make the modification of Harada with the IBM TDB that is proposed by the Final Rejection. For at least these reasons, the Final Rejection has failed to present a *prima facie* case of obviousness of claim 24 over Harada in view of the IBM TDB.

VI. Regarding Grounds of Rejection (6), the Final Rejection states, on page 11:

> Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A) in view of Endo (JP 06-176517 A).
>
> See the discussion of Harada et al. (JP 9-035230 A), *supra.*

> With regard to claim 6, Harada et al. (JP 9-035230 A) does not explicitly show wherein said flexible elements are substantially aligned with a center of mass of said rigid body (i.e., the slider).
>
> Endo (JP 06-176517 A), however, disclose wherein a support suspension portion of the flexure end of a suspension is absorbed into a slider (i.e., rigid body), in order to, inter alia, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.
>
> It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A)..
>
> The rationale is as follows: one of ordinary skill in the art at the time of the invention was made would have been motivated to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A) in order to, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

Appellant respectfully disagrees with the Final Rejection assertion that 'it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada, as explicitly taught and suggested by Endo (JP 06-176517 A). Initially note that the Final Rejection does not even assert a case of obviousness of claim 6, instead alleging that it "would have been obvious ... to provide the teaching of..." Perhaps this is because Endo involves a suspension that is fitted into a groove of the slider whereas Harada claims to have gimbals that are located to the side of the slider, and there is no evident way to reconcile these opposite approaches. As mentioned above, the Final Rejection provides no suggestion as to how providing the teaching of Endo would accomplish the device defined in claim 6.

In response to this argument, the Final Rejection on page 19 essentially reiterates the rejection quoted above, but rephrases the allegation of obviousness to state:

> It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230 A), as explicitly taught and suggested by Endo (JP 06-176517 A) in order to, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

As noted above with regard to the alleged anticipation of claim 1 by Harada, Harada differs from that claim in several material aspects, and in many ways is difficult if not impossible to understand. Moreover, Harada does not enable one of ordinary skill in the art to make a workable device, and Harada would not be enabled by somehow substantially aligning elements with a center of mass. Stated differently, the Examiner's proposed modification of Harada with Endo would not have resulted in an enabled disclosure that could be used to reject claim 6 as being obvious. In addition, because of the lack of enablement, one of ordinary skill in the art would not have been motivated to make the modification proposed by the Examiner. As a related issue, it is very unclear how this proposed feature of Harada would be accomplished. For at least these reasons, the Final Rejection has not presented a *prima facie* case of obviousness of claim 6 over Harada in view of Endo.

VII. Regarding Grounds of Rejection (7), the Final Rejection states, on page 12:

> Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230) and IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No 36, Iss. No. 2, pp. 379-380, published February 1, 1993, as applied to claim 11 above, and further in view of Fukuoka (JP 09-148639 A).
>
> ...

As discussed above, both Harada and the IBM TDB are nonenabled and provide disincentives rather than motivation to make the combination proposed in the Final rejection. Fukuoka (JP 09-148639 A; "Fukuoka") teaches prevention of deformation of an inner electrode layer by adding silicon nitride (p. 1, ll. 15-18). The IBM TDB, however, does not mention an electrode or teach where an electrode is to be located, and so it is at best unclear that deformation of an electrode would be a problem. Instead,

because the IBM TDB requires deformation of "piezo A" and the arms and other structure surrounding "piezo A," one of ordinary skill in the art would not have modified the proposedly combined Harada and the IBM TDB with Fukuoka as proposed by the Final Rejection.

VIII. Regarding Grounds of Rejection (8), the Final Rejection states, on page 12:

> Claims 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230 A).
>
> Claim 24 is rejected under 35 U.S.C. §03(a) as being unpatentable over Harada in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No 36, Iss. No. 2, pp. 379-380, published February 1, 1993.
>
> As per claims 21, 24 and 27, assuming arguendo, that the transducing layers Harada et al. (JP 9-035230 A). at the pole tips proximate designator (113) in FIG. 3 cannot be reasonably construed as being "substantially" perpendicular to the air bearing media-facing surface at their very tip ends at the air-bearing transducing gap (113), and as such, perpendicular to the plane in which flexures (3) reside, Official notice is taken that vertically oriented-to-air-bearing-surface pole transducing layers (not only including perpendicular transducing pole tips but also perpendicular yokes –corresponding to designator (112) in FIG. 3 of Harada et al. (JP 9-035230 A)) are notoriously old and well known and ubiquitous in the art; such Officially noticed fact being capable of instant and unquestionable demonstration as being well-known.
>
> It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the transducing layers of the yoke (112)(as well as the nearly vertical pole tips (113) transducing layers disclosed by Harada et al. (JP 9-035230 A)) formed so as to be entirely substantially perpendicular to the air-bearing surface, and as such, perpendicular to the extending direction of the plane within which flexures (3) lie, in order to facilitate the batch fabrication of the head slider, maximize the distance between the yoke layers and the media to minimize extraneous noise, and reduce the number of bends to the entire pole layers to minimize deleterious fracturing of magnetic domains within the poles, as is well known, established and appreciated in the art.

Appellant initially objects to the Examiner's use of "Official notice" to provide the alleged motivation for one of ordinary skill in the art "to provide the transducing layers of the yoke (112)(as well as the nearly vertical pole tips (113) transducing layers disclosed by Harada et al. (JP 9-035230 A)) formed so as to be entirely substantially perpendicular to the air-bearing surface, and as such, perpendicular to the extending

direction of the plane within which flexures (3) lie." This motivation is alleged by the Examiner to be "in order to facilitate the batch fabrication of the head slider, maximize the distance between the yoke layers and the media to minimize extraneous noise, and reduce the number of bends to the entire pole layers to minimize deleterious fracturing of magnetic domains within the poles, as is well known, established and appreciated in the art." To the extent that this rejection is based on facts within the personal knowledge of the examiner, appellant respectfully requests that the Examiner provide an affidavit as required by 37 CFR 1.104(d)(2). As noted in *In re Lee*, 277 F.3d 1338, 1342-1343 (Fed. Cir. 2002):

> "The factual inquiry whether to combine references must be thorough and searching." *Id.* It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. See, e.g., *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1124-25, 56 U.S.P.Q.2D (BNA) 1456, 1459 (Fed. Cir. 2000) ("a showing of a suggestion, teaching, or motivation to combine the prior art references is an 'essential component of an obviousness holding'") (quoting *C.R. Bard, Inc., v. M3 Systems, Inc.*, 157 F.3d 1340, 1352, 48 U.S.P.Q.2D (BNA) 1225, 1232 (Fed. Cir. 1998)); *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2D (BNA) 1614, 1617 (Fed. Cir. 1999) ("Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."); *In re Dance*, 160 F.3d 1339, 1343, 48 U.S.P.Q.2D (BNA) 1635, 1637 (Fed. Cir. 1998) (there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant); *In re Fine*, 837 F.2d 1071, 1075, 5 U.S.P.Q.2D (BNA) 1596, 1600 (Fed. Cir. 1988) ("'teachings of references can be combined *only* if there is some suggestion or incentive to do so.'") (emphasis in original) (quoting *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 U.S.P.Q. (BNA) 929, 933 (Fed. Cir. 1984)).
>
> The need for specificity pervades this authority. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2D (BNA) 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed"); *In re Rouffet*, 149 F.3d 1350, 1359, 47 U.S.P.Q.2D (BNA) 1453, 1459 (Fed. Cir. 1998) ("even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention

> obvious."); *In re Fritch*, 972 F.2d 1260, 1265, 23 U.S.P.Q.2D (BNA) 1780, 1783 (Fed. Cir. 1992) (the examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references").

Appellant respectfully asserts that the Examiner has not presented even minimal evidence to support this obviousness rejection.

Appellant also respectfully asserts that it is at best unclear how such "perpendicular transducing pole tips" and "perpendicular yokes" would be formed on the device of Harada. Moreover, it is unclear that Harada could be made by "batch processing." These reasons further argue that one of ordinary skill in the art would not have made the modification proposed by the Final Rejection.

In addition, the best example of a head having the attributes described as advantageous by the Examiner's assertion of "Official notice" would be an implementation having a single, straight vertical pole layer, such as that described by U.S. Patent No. 4,286,299 to Shirahata et al. As noted above, Shirahata et al. teaches that a magnetic head may have a single magnetic core layer around which is wrapped a winding carrying the recording current for vertical magnetization. Such a single magnetic core would have no bends or sharp transitions to adjacent magnetic layers, and so would "minimize deleterious fracturing of magnetic domains within the poles, as is well known, established and appreciated in the art." In other words, the Examiner appears to be providing the stamp of "Official notice" to the single pole implementation described by U.S. Patent No. 4,286,299 to Shirahata et al. Implementations such as Shirahata et al., as noted above, contradict the Examiner's earlier position that transducers inherently need multiple layers.

IX. Regarding Grounds of Rejection (9), the Final Rejection states, on pages 15 and 16:

> With regard to claim 11 (which is the basis of newly presented rejected claims 24-26), Tokuyama et al. (US 5,57,573) remains silent with respect to the aforementioned actuator including a layer or layers of piezoelectric material (i.e., an electrorestrictive actuator as per claim 11).
>
> ...

> It would have been obvious to one of ordinary skill in the art would have been motivated to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Tokuyama et al. (US 5,57,573).
>
> The rational is as follows one of ordinary skill in the art at the time the invention was made to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Tokuyama et al. (US 5,57,573) in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

As discussed above, the IBM TDB is nonenabled, and provides multiple reasons why one of ordinary skill in the art would not have looked to it to modify a working device, as the resulting device would likely be inoperable. Appellant respectfully asserts that one of such skill would have looked beyond the self-laudatory advantages claimed by the IBM TDB (some of which are facially untrue, as explained above) to realize its serious disadvantages, and for that reason would not have been incented to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Tokuyama.

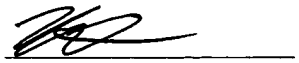
In addition, *assuming arguendo* that one of such skill would have made the substitution proposed by the Final Rejection and *assuming arguendo* that the resulting device would be operable, Tokuyama as proposedly modified would have substantial nonobvious differences from claim 11. For example, Tokuyama as proposedly modified would not have "a wafer substrate piece disposed between an electromagnetic transducer and an electrostrictive actuator," in contrast to claim 11. Moreover, Tokuyama as proposedly modified would not have "said substrate piece shaped as a rigid body adjoining said transducer and as a flexible element connecting said rigid body and said actuator," in contrast to claim 11.

Conclusion

As detailed above, the Final Rejection fails to state a *prima facie* case of indefiniteness, inadequate written description, anticipation or obviousness for any of the pending claims. Appellant respectfully asserts that all the pending claims are allowable and requests reversal of the Examiner's rejections.

This brief is being submitted along with a check in the amount of $250.00 to pay the Appeal Brief Fee.

Respectfully submitted,



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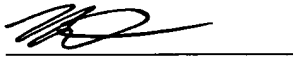

Mark Lauer

APPENDIX A – CLAIMS APPENDIX

1. A device for reading or writing information, the device comprising:

an electromagnetic transducer including a plurality of solid transducer layers,

a substrate adjoining said transducer, said substrate shaped as a rigid body adjacent to said transducer and as a plurality of flexible elements distal to said transducer, and

an actuator attached to said substrate distal to said transducer.

2. The device of claim 1, wherein said actuator includes a layer of piezoelectric material.

3. The device of claim 1, wherein:

said actuator includes a layer of piezoelectric material, and

said transducer layers are substantially parallel with said layer of piezoelectric material.

4. The device of claim 1, wherein said actuator includes a plurality of layers of piezoelectric material.

6. The device of claim 1, wherein said flexible elements are substantially aligned with a center of mass of said rigid body.

7. The device of claim 1, wherein said rigid body has a media-facing-surface separated from a back surface in a Z-direction, and at least a portion of said flexible elements is disposed at a Z-height between said surfaces.

8. The device of claim 1, wherein said flexible elements are aligned substantially with a plane, and said rigid body and said actuator are intersected by said plane.

9. The device of claim 1, wherein said rigid body has a media-facing-surface separated from a back surface, and said back surface has a protrusion extending away from said media-facing surface.

10. The device of claim 1, wherein at least one of said flexible elements contains a plurality of conductive leads.

11. A device for reading or writing information, the device comprising:

a wafer substrate piece disposed between an electromagnetic transducer and an electrostrictive actuator, said substrate piece shaped as a rigid body adjoining said transducer and as a flexible element connecting said rigid body and said actuator.

12. The device of claim 11, wherein said actuator includes a layer of piezoelectric material.

13. The device of claim 11, wherein:

said actuator includes a layer of piezoelectric material, and

said transducer includes a plurality of layers that are substantially parallel with said layer of piezoelectric material.

14. The device of claim 11, wherein said flexible element includes a plurality of flexible portions aligned substantially with a plane, and said rigid body and said actuator are intersected by said plane.

17. The device of claim 11, wherein said rigid body has a media-facing-surface separated from a back surface, and said back surface has a protrusion extending away from said media-facing surface.

18. The device of claim 11, wherein said rigid body and said actuator contain a material including silicon.

19. The device of claim 11, wherein said device includes means for providing electrical voltage to said actuator.

20. A device for reading or writing information, the device comprising:

an electromagnetic transducer including a plurality of solid transducer layers,

a substrate adjoining said transducer, said substrate shaped as a rigid body adjacent to said transducer and as a plurality of flexible elements distal to said transducer, and

actuation means for positioning said transducer,

said actuation means attached to said substrate distal to said transducer.

21. The device of claim 1, wherein said flexible elements extend substantially parallel to a first plane and said transducer layers are substantially parallel to a second plane that is perpendicular to said first plane.

22. The device of claim 1, wherein said transducer layers include a plurality of active layers that convert a magnetic signal to an electrical signal, said active layers separated from said substrate by a plurality of inactive layers that do not convert between magnetic and electrical signals.

23. The device of claim 1, wherein no part of said substrate is disposed further than said transducer from said actuator.

24. The device of claim 11, wherein said flexible element extends substantially parallel to a first plane and said transducer includes a plurality of layers that are substantially parallel to a second plane that is perpendicular to said first plane.

25. The device of claim 11, wherein said transducer includes a plurality of active layers that convert a magnetic signal to an electrical signal, said active layers separated from said substrate by a plurality of inactive layers that do not convert between magnetic and electrical signals.

26. The device of claim 11, wherein no part of said substrate piece is disposed further than said transducer from said actuator.

27. The device of claim 20, wherein said flexible elements extend substantially parallel to a first plane and said transducer layers are substantially parallel to a second plane that is perpendicular to said first plane.

28. The device of claim 20, wherein said transducer layers include a plurality of active layers that convert a magnetic signal to an electrical signal, said active layers separated from said substrate by a plurality of inactive layers that do not convert between magnetic and electrical signals.

29. The device of claim 20, wherein no part of said substrate is disposed further than said transducer from said actuation means.

APPENDIX B – EVIDENCE APPENDIX

A copy of U.S. Patent Number 4,286,299 to Shirahata et al. ("Shirahata") is enclosed. Shirahata was first quoted and discussed in the Request for Reconsideration filed December 3, 2003, which was noted to have been considered by the Examiner in an Advisory Action dated December 3, 2003

APPENDIX C – RELATED PROCEEDINGS APPENDIX

Appellant is not aware of any Related Proceedings.